FORM PTO-1390 (Modified) (REV 11-2000) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER	
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U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR	
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INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE
PCT/US00/17477	26 June 2000 (26.06.00)
PRIORITY DATE CLAIMED	
15 July 1999 (15.07.99)	

TITLE OF INVENTION

METHOD AND APPARATUS FOR PROVIDING ON-SCREEN DISPLAYS FOR A MULTI-COLORIMETRY RECEIVER

APPLICANT(S) FOR DO/EO/US

Charles Bailey Neal

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include itens (5), (6), (9) and (24) indicated below.
4. ☐ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
   a. ☐ is attached hereto (required only if not communicated by the International Bureau).
   b. ☐ has been communicated by the International Bureau.
   c. ☒ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
   a. ☐ is attached hereto.
   b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
   a. ☐ are attached hereto (required only if not communicated by the International Bureau).
   b. ☐ have been communicated by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☒ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).
11. ☒ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☒ A copy of the International Search Report (PCT/ISA/210).

Items 13 to 20 below concern document(s) or information included:

13. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
20. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
21. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
22. ☒ Certificate of Mailing by Express Mail
23. ☒ Other items or information:

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EXPRESS MAIL LABEL NO. EL902321815US **DATE DEPOSITED: January 10, 2002**

U.S. APPLICATION NO. (If known, see 37 CFR)	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
10/050894	PCT/US00/17477	RCA 89633

531 Rec'd PCT/PTO 10 JAN 2002

24. The following fees are submitted:.	CALCULATIONS	PTO USE ONLY
BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :		
☐ Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO $1040.00		
☒ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO $890.00		
☐ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO $740.00		
☐ International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) $710.00		
☐ International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) $100.00		
ENTER APPROPRIATE BASIC FEE AMOUNT =	$890.00	
Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).	$0.00	

CLAIMS	NUMBER FILED		NUMBER EXTRA		RATE		
Total claims	8	- 20 =	0	x	$18.00	$0.00	
Independent claims	2	- 3 =	0	x	$84.00	$0.00	
Multiple Dependent Claims **(check if applicable).**					☐	$0.00	
TOTAL OF ABOVE CALCULATIONS =						$890.00	
☐ Applicant claims small entity status. See 37 CFR 1.27). The fees indicated above are reduced by 1/2.						$0.00	
SUBTOTAL =						$890.00	
Processing fee of **$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (f)). +						$0.00	
TOTAL NATIONAL FEE =						$890.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) **(check if applicable).** ☐						$40.00	
TOTAL FEES ENCLOSED =						$930.00	
						Amount to be: refunded	$
						charged	$ 930.00

a. ☐ A check in the amount of _____ to cover the above fees is enclosed.

b. ☒ Please charge my Deposit Account No. **07-0832** in the amount of **$930.00** to cover the above fees. A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. **07-0832** A duplicate copy of this sheet is enclosed.

d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

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THOMSON multimedia Licensing Inc.
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40,677
REGISTRATION NUMBER

January 10, 2002
DATE

EXPRESS MAIL LABEL NO. EL902321815US RCA-89633

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Charles Bailey Neal

Filed : Herewith

For : METHOD AND APPARATUS FOR PROVIDING ON-SCREEN DISPLAYS FOR A MULTI-COLORIMETRY RECEIVER

PRELIMINARY AMENDMENT

Hon. Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Sir:

In the US national phase application of PCT/US00/17477 filed herewith, please enter the following amendments:

IN THE SPECIFICATION:

Please amend the specification as follows:

On Page 1, line 3, please insert the following paragraph:

--This application claims the benefit under 35 U.S.C. § 365 of International Application PCT/US00//17477, filed June 26, 2000, which was published in accordance with PCT Article 21(2) on January 25, 2001 in English; and which claims benefit of U.S. provisional application serial no. 60/144,151 filed July 15, 1999.--

IN THE CLAIMS:

Please amend the claims (which are an annex of the International Preliminary Examination Report) as follows. A marked-up version of the claims is attached herewith.

1.(AMENDED) A video signal processing apparatus, comprising:

a first video signal source for providing a first video signal having a first color format;

a second video signal source for providing a second video signal having a second color format;

means for generating an On Screen Display (OSD) signal formatted in accordance with the first or second color format, the generating means comprising

a color palette that includes color information formatted in accordance with a predetermined color format, and

a plurality of color conversion matrices for converting the color information in the color palette to provide the OSD signal, which is formatted in accordance with a selected one of the first or second color format, in response to the selection of the first or second video signal source; and

means, operatively coupled to the OSD generating means and the first and second video signal sources, for combining the OSD signal generated by the OSD generating means with the selected one of the first or second video signals.

2. (AMENDED) The apparatus of claim 1, wherein the color palette comprises color information formatted in the RGB format.

3. (AMENDED) The apparatus of claim 1, wherein the plurality of conversion matrices includes a conversion matrix for converting the color information in the color palette into Y, P_R, P_B format, and a conversion matrix for converting the color information in the color palette into Y, P_I, P_Q format.

4. The apparatus of claim 1, wherein the first video signal is an analog television signal.

5. The apparatus of claim 1, wherein the second video signal is a digital television signal.

6. (AMENDED) A method of producing graphics having a color format that matches the color format of a received signal, the method comprising the steps of:

selecting a video signal source from a plurality of video signal sources, the signal source providing video signals formatted in accordance with a first color signal format;

providing a color palette that includes color information formatted in accordance with a predetermined color format;

providing a plurality of color conversion matrices, wherein each color conversion matrix is adapted to convert the color information in the color palette to provide a graphics signal that is formatted in accordance with a particular color format;

selecting a desired one of the plurality of color conversion matrices that corresponds to the selected video signal source and generating a graphics signal formatted in accordance with the first color signal format;

combining the graphics signal with the received signal; and

processing the combined signal to generate an output signal.

7. The method of claim 6, wherein the color palette comprises color information formatted in the RGB format.

8. The method of claim 6, wherein the color conversion matrices convert the color information in the color palette into one of a Y, P_R, P_B formatted signal and Y, P_I, P_Q formatted signal.

IN THE ABSTRACT:

Please add the following Abstract.

-- An apparatus and a method for adjusting the colors of the on-screen display graphics to match the colors of the video with which the OSD graphics are to be combined. In one aspect, a selected one of a plurality of OSC color palettes is used to produce graphics for a selected one of a plurality of signal sources. As such, the appropriately formatted palette is used to produce graphics for a similarly formatted input signal, i.e., an analog source would be combined with graphics produced from a palette having Y, P_I, P_Q formatted signals. Consequently, the color compensation matrices would properly compensate both the graphics and the video from each source. In another aspect, a desired one of a plurality of matrices operates on the OSD signal source to match the OSD colorimetry with the input signal colorimetry.--

REMARKS

The specification has been amended to include a reference to the priority applications.

The claims have been amended to remove reference indicia.

To meet the requirements of the United States, the Abstract (as originally filed in the PCT application) is added.

No fee is believed to have been incurred by virtue of this amendment. However if a fee is incurred on the basis of this amendment, please charge such fee against deposit account 07-0832

Respectfully submitted,
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January 10, 2002

MARKED UP VERSION OF THE AMENDED CLAIMS

1.(AMENDED) A video signal processing apparatus, comprising:

a first video signal source [(150)] for providing a first video signal having a first color format;

a second video signal source [(151)] for providing a second video signal having a second color format;

means for generating an On Screen Display (OSD) signal [(103,105,165)] formatted in accordance with the first or second color format, the generating means comprising

a color palette [(125)] that includes color information formatted in accordance with a predetermined color format, and

a plurality of color conversion matrices [(107, 109)] for converting the color information in the color palette to provide the OSD signal, which is formatted in accordance with a selected one of the first or second color format, in response to the selection of the first or second video signal source; and

means [(110,140,122)], operatively coupled to the OSD generating means and the first and second video signal sources, for combining the OSD signal generated by the OSD generating means with the selected one of the first or second video signals.

2. (AMENDED) The apparatus of claim 1, wherein the color palette [(125)] comprises color information formatted in the RGB format.

3. (AMENDED) The apparatus of claim 1, wherein the plurality of conversion matrices [(107, 109)] includes a conversion matrix for converting the color information in the color palette into Y, P_R, P_B format, and a conversion matrix for converting the color information in the color palette into Y, P_I, P_Q format.

4. The apparatus of claim 1, wherein the first video signal is an analog television signal.

5. The apparatus of claim 1, wherein the second video signal is a digital television signal.

6. (AMENDED) A method of producing graphics having a color format that matches the color format of a received signal, the method comprising the steps of:

selecting a video signal source from a plurality of video signal sources [(150,151)], the signal source providing video signals formatted in accordance with a first color signal format;

providing a color palette [(125)] that includes color information formatted in accordance with a predetermined color format;

providing a plurality of color conversion matrices [(107, 109)], wherein each color conversion matrix is adapted to convert the color information in the color palette to provide a graphics signal that is formatted in accordance with a particular color format;

selecting a desired one of the plurality of color conversion matrices that corresponds to the selected video signal source and generating a graphics signal [$(Y,P_R,P_B;Y,P_I,P_Q)$] formatted in accordance with the first color signal format;

combining the graphics signal with the received signal; and

processing the combined signal to generate an output signal [(RBG)].

7. The method of claim 6, wherein the color palette comprises color information formatted in the RGB format.

8. The method of claim 6, wherein the color conversion matrices convert the color information in the color palette into one of a Y, P_R, P_B formatted signal and Y, P_I, P_Q formatted signal.

METHOD AND APPARATUS FOR PROVIDING ON-SCREEN DISPLAYS FOR A MULTI-COLORIMETRY RECEIVER

The invention relates to an apparatus and a method for processing video signals, and more particularly, to an apparatus and a method for processing on screen display (OSD) signals and video signals from various sources having different colorimetries.

Modern television receivers are designed to receive and process video signals from various sources, for example, analog television signals from a National Television Standards Committee (NTSC) transmission or a video tape, as well as digital video signals transmitted in accordance with the ATSC Digital Television Standard, A/54 (1995). Different signal sources may be encoded according to different colorimetries. "Colorimetry" refers to the combination of color primaries, transfer characteristics, and matrix coefficients associated with generating and processing color representative signals. For example, NTSC signals comply with SMPTE 170M colorimetry and ATSC signals default to comply with ITU-R BT.709 (1990) colorimetry. Additionally, ISO/IEC 13818-2 provides for the broadcaster to specify the input colorimetry to the receiver to allow for other colorimetry combinations.

In view of the possible differences in colorimetries between different signals, it is desirable to design television receiver circuitry with colorimetry compensation so that the video display of the signals from the various sources has a uniform colorimetry. Such circuitry compensates the input video signals such that the color of similar objects are substantially similar regardless of the particular colorimetry. For example, a flesh tone from an ATSC source should appear similar to a flesh tone from an NTSC source.

Television receivers also produce and display OSD graphics that provide information and enable user interface functions. Typically, the OSDs are generated in response to user input to provide information about a program or the

receiver, and to allow the user to control functions such as channel selection, image quality and the like. An OSD system usually comprises a common source of OSD signals, which signals are generated by a processing unit in response to received signals or user input, stored in a memory, and then read out and combined with the received video signals. The signals are combined after colorimetry compensation has been performed on the video signal. The OSD signals are combined with the video signals in a mixer that is controlled by a microprocessor. As the lines of the image are traced on a CRT, or a similar display device, the microprocessor selects either the OSD signal or the video signal for output in response to an output of a counter, thereby selectively inserting the OSD image onto the video program image.

However, it may be desirable to couple the OSD signal to the video signal prior to the colorimetry compensation. Coupling the signals prior to the colorimetry compensation can reduce memory requirements and reduce processing delays. In this regard, OSD colors may change when colorimetry compensation is applied to a combined signal that includes video program and OSD signals. As such, the OSD graphics colorimetry may change substantially from one video source to another. Therefore, it is also desirable to couple the OSD signal to the video signal prior to the colorimetry compensation in a manner that provides uniform color output of the OSD image regardless of the signal source.

The present invention provides a method and apparatus for coupling an OSD signal with a video program signal prior to colorimetry compensation. In particular, the present invention provides a method and apparatus for coupling an OSD signal with a video program signal prior to colorimetry compensation in a manner that the displayed OSD colors are uniform regardless of the signal source.

In one aspect, the present invention comprises an OSD unit having an OSD palette, which OSD unit is coupled to a display processor. The output of the display

processor is coupled to one of a plurality of matrices to provide colorimetry compensation. The output of the selected matrix is coupled to a display unit, for example a CRT, a flat panel display or the like, for providing an output image.

In another aspect, the present invention comprises an OSD unit having a plurality of OSD palettes, each one of the plurality of OSD palettes having OSD data stored in a particular colorimetry format and being associated with a particular one of a plurality of signal sources. A display processor is coupled, via a switch, to a selected one of the OSD palettes in response to the selection of a particular signal source. In this manner, the colorimetry of the OSD signal matches the colorimetry of the video program signal from the signal source. The output of the display processor is coupled to one of a plurality of matrices to provide colorimetry compensation. The output of the selected matrix is coupled to a display unit.

In another aspect, the present invention comprises an OSD unit having an OSD palette, and a plurality of OSD matrices, each one of the plurality of OSD matrices adapted to provide a particular colorimetry compensation and being associated with a particular one of a plurality of signal sources. The OSD palette is coupled to a selected one of the OSD matrices in response to the selection of a particular signal source. In this manner, the colorimetry of the OSD signal is adjusted to match the colorimetry of the video program signal from the selected signal source. The output of the selected OSD matrix is coupled to a display processor, wherein the OSD signal is combined with a video program signal. The output of the display processor is then coupled, via a switch, to a selected one of a plurality of matrices to provide colorimetry compensation. The output of the selected matrix is coupled to a display unit.

Therefore, in accordance with the present invention, the colorimetry of the OSD signal is matched to

the colorimetry of the video signal, and the OSD signal is coupled to the video program signal prior to the matrix operation of the combined signal thereby providing uniform OSD colors at the display regardless of the signal source.

The teachings of the present invention are described with reference to the accompanying drawings, wherein:

FIG. 1 illustrates a block diagram of an OSD system wherein the OSD signal is coupled to the video signal prior to the colorimetry compensation;

FIG. 2 illustrates a block diagram of an OSD system wherein the OSD signal is coupled to the video program signal in a manner to provide uniform colorimetry regardless of the signal source; and

FIG. 3 illustrates a block diagram of a another embodiment of an OSD system wherein the OSD signal is coupled to the video program signal in a manner to provide uniform colorimetry regardless of the signal source.

To facilitate understanding, common reference numerals have been used to designate elements that are common to the figures.

FIG. 1 depicts a simplified block diagram of a video signal processing apparatus 100 in accordance with the present invention. The construction of the elements of apparatus 100 are known to those skilled in the art and will not be discussed in detail here.

Apparatus 100 comprises NTSC chroma decoder 104, which receives an NTSC signal via input 150. The NTSC signal is received and demodulated and coupled to chroma decoder 104 in the conventionally known manner. Chroma decoder 104 provides a luminance signal Y and two color difference signals I and Q. The color difference signals I and Q comprise R-Y and B-Y components of different magnitude and represent signals on quadrature axes rotated 33 degrees counterclockwise from the R-Y, B-Y axes.

The analog output signal Y, I, and Q are applied to digitizer 106 that provides digital representations of the signals, designated Y, P_I and P_Q. The digital

representations are coupled to a first terminal of switch 122. Switch 122, as well as the various other switches illustrated in the figures that couple the various program or OSD signals to the respective processors or matrices, is controlled by microprocessor 165, which controls the overall operation of the apparatus. Microprocessor 165 may comprise any one of a plurality of control devices known to those skilled in the art for controlling the various elements of the apparatus. Also, although the present invention describes a single microprocessor, those skilled in the art will realize that microprocessor 165 may comprise various dedicated devices to control specific functions, i.e., a memory controller, a microprocessor interface unit, and the like.

Digital video signals are coupled to digital video decoder 108 via input 151. Digital video decoder provides output signals Y, P_R and P_B, which are coupled to a second input of switch 122. The color difference signals P_R and P_B comprise R-Y and B-Y signals that are modified by scale factors. The output of switch 122 is coupled to display processor 110, which includes a buffer memory for holding video data and/or combined video and OSD data to be read out. The read out of the video data stored in display processor 110 is controlled by microprocessor 165.

The OSD signals are generated using OSD palette 102, which includes representations of the OSD signals in Y, P_R, and P_B format. OSD palette 102 may be embodied in software form, wherein a particular sequence of bits is associated with a particular color. Based on the color information in OSD palette 102, microprocessor 165 generates an OSD bitstream and transfers the generated OSD bitstream to display processor 110. The generated OSD bitstream is combined with the video program signal based on the desired location of the OSD image on the output image. Thus, the memory of display processor 110 includes a bit mapped representation of the output signal, which includes the video program image combined with the OSD image.

When it is desired to display the bit mapped image stored in display processor 110, the stored bitstream corresponding to the image is read out to either one of the matrices 112 or 114 via switch 124. Microprocessor 165 controls switch 124 to couple the output of display processor 110 to the input of matrix 114 if the input signal is an analog signal, and couple the output of display processor 110 to the input of matrix 112 if the input signal is a digital signal. Matrices 112 and 114 operate in the conventionally known manner to provide RGB output signals in response to the input signals. By selecting the appropriate one of the matrices 112 and 114, proper colorimetry processing is applied to the selected input signal to provide a display having uniform colorimetry regardless of the selected input signal.

Switch 126 couples the output of the selected matrix with the input of display controller 116. Display controller 116 generally includes circuitry for controlling the output image in response to user input controls, such as brightness and contrast. The output of display controller 116 is then coupled to a display device 120, which may include a CRT, a flat panel display, or the like.

In apparatus 100, an OSD signal is coupled to display processor 110 prior to matrices 112 and 114, which convert the input signals to RGB format for display. This is in contrast with prior art devices, wherein the OSD signal is combined with the video program signal in a mixer disposed downstream of display controller 116.

However, apparatus 100 does not match the colorimetry of the OSD signals in response to the selected signal source. This may lead to undesired changes in the colors of the OSD depending on the selected signal source. In other words, the OSD colors will change as the colorimetry compensation is changed. To avoid such changes, it is desirable to modify the OSD colors to complement the compensation provided to the video program signal.

Fig. 2 illustrates a second embodiment of the present invention, wherein OSD colors are modified to complement the colorimetry processing applied to the combined video signal. Apparatus 200 includes OSD palettes 103 and 105, wherein OSD palette 103 provides output signals in the Y, P_R, P_B format, and OSD palette 105 provides output signals in the Y, P_I, P_Q format. In operation, OSD palette 105 is coupled to display processor 110 when an analog input signal is selected via signal source 150 and OSD palette 103 is coupled to display processor 110 when a digital input signal is selected via signal source 151. The desired one of palettes and 103 and 105 is selected by switch 140, which is controlled by microprocessor 165.

When apparatus 200 receives an analog signal via source 150, switch 122 is coupled to the output of digitizer 106, switch 140 is coupled to the output of OSD palette 105, switch 124 is coupled to matrix 114, and switch 126 is coupled to matrix 114. In this manner, the input signal and the OSD signal are both in the Y, PI, PQ format and the colorimetries match.

Similarly, when apparatus 200 receives a digital signal via source 151, switch 122 is coupled to the output of digital video decoder 108, switch 140 is coupled to the output of OSD palette 103, switch 124 is coupled to matrix 112, and switch 126 is coupled to matrix 112. Here, the input signal and the OSD signal are both in the Y, PR, PB format and the colorimetries again match. As a result, the colors of the OSD remain uniform regardless of whether the input signal is from signal source 150 or 151.

Fig. 3 illustrates another embodiment of the present invention, wherein OSD colors are modified to complement the colorimetry compensation applied to the video program signal. In apparatus 300, OSD palette 125 is coupled to display processor 110 via either matrix 107 or matrix 109. In this case, OSD palette 125 stores the OSD information in RGB format. Matrix 107 operates on the OSD signals from OSD palette 125 to provide Y, P_R, P_B

formatted signals. Matrix 109 operates on the OSD signals to provide Y, P_I, P_Q formatted signals. The outputs of matrices 107 and 109 are coupled to display processor 110 via switch 140, which is controlled by microprocessor 165.

When source 150 is selected, thereby providing Y, P_I, P_Q signals to display processor 110, switch 122 is coupled to the output of digitizer 106, switch 142 is coupled to the input of matrix 109, switch 140 is coupled to the output of matrix 109, switch 124 is coupled to matrix 114, and switch 126 is coupled to matrix 114. In this manner, the input signal and the OSD signal are both in the Y, PI, PQ format and the colorimetries match.

Similarly, when source 151 is selected, thereby providing Y, P_R, P_B signals to display processor 110, switch 122 is coupled to the output of digital video decoder 108, switch 142 is coupled to matrix 107, switch 140 is coupled to matrix 107, switch 124 is coupled to matrix 112, and switch 126 is coupled to matrix 112. Here, the video signal and the OSD signal are both in the Y, P_R, P_B format and the colorimetries again match. As the colorimetry of the OSD signal match the colorimetry of the input video signal regardless of the signal source, the colors of the OSD on the output image remain uniform regardless of whether the input signal is an analog signal or a digital signal.

It will be apparent to those skilled in the art that although the present invention has been described in terms of various exemplary embodiments, modifications and changes may be made to the disclosed embodiment without departing from the essence of the invention. For example, those skilled in the are will realize that various elements for operating on the video or OSD signals, as well as the switches for coupling the signals from one element to another may be implemented in either hardware or software form using conventionally known techniques. Therefore, it is to be understood that the present invention is intended to cover all modifications as would fall within the true scope and spirit of the present invention.

1. A video signal processing apparatus, comprising:

a first video signal source (150) for providing a first video signal having a first color format;

a second video signal source (151) for providing a second video signal having a second color format;

means for generating an On Screen Display (OSD) signal (103,105,165) formatted in accordance with the first or second color format, the generating means comprising

a color palette (125) that includes color information formatted in accordance with a predetermined color format, and

a plurality of color conversion matrices (107, 109) for converting the color information in the color palette to provide the OSD signal, which is formatted in accordance with a selected one of the first or second color format, in response to the selection of the first or second video signal source; and

means (110,140,122), operatively coupled to the OSD generating means and the first and second video signal sources, for combining the OSD signal generated by the OSD generating means with the selected one of the first or second video signals.

2. The apparatus of claim 1, wherein the color palette (125) comprises color information formatted in the RGB format.

3. The apparatus of claim 1, wherein the plurality of conversion matrices (107, 109) includes a conversion matrix for converting the color information in the color palette into Y, P_R, P_B format, and a conversion matrix for converting the color information in the color palette into Y, P_I, P_Q format.

4. The apparatus of claim 1, wherein the first video signal is an analog television signal.

5. The apparatus of claim 1, wherein the second video signal is a digital television signal.

6. A method of producing graphics having a color format that matches the color format of a received signal, the method comprising the steps of:

selecting a video signal source from a plurality of video signal sources (150,151), the signal source providing video signals formatted in accordance with a first color signal format;

providing a color palette (125) that includes color information formatted in accordance with a predetermined color format;

providing a plurality of color conversion matrices (107, 109), wherein each color conversion matrix is adapted to convert the color information in the color palette to provide a graphics signal that is formatted in accordance with a particular color format;

selecting a desired one of the plurality of color conversion matrices that corresponds to the selected video signal source and generating a graphics signal ($Y,P_R,P_B;Y,P_I,P_Q$) formatted in accordance with the first color signal format;

combining the graphics signal with the received signal; and

processing the combined signal to generate an output signal (RBG).

7. The method of claim 6, wherein the color palette comprises color information formatted in the RGB format.

8. The method of claim 6, wherein the color conversion matrices convert the color information in the color palette into one of a Y, P_R, P_B formatted signal and Y, P_I, P_Q formatted signal.

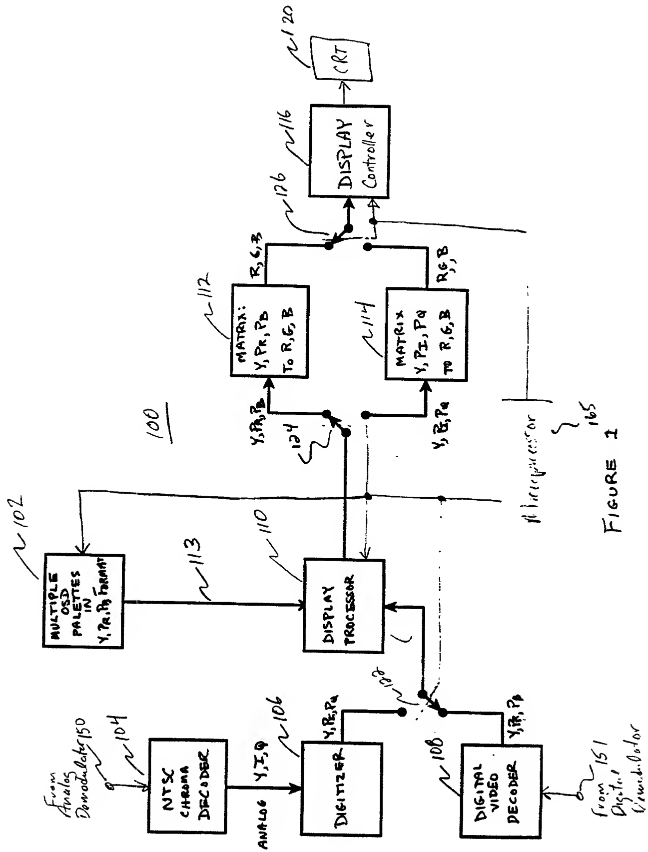
CRT
120
DISPLAY
Controller
116
126
R,G,B
R,G,B
MATRIX:
Y,PR,PB
To R,G,B
112
MATRIX
Y,PI,PQ
TO R,G,B
114
100
Y,PR,PB
124
Y,PI,PQ
Microprocessor
165
MULTIPLE
OSD
PALETTES
IN
Y,PR,PB FORMAT
102
113
DISPLAY
PROCESSOR
110
122
Y,PI,PQ
Y,PR,PB
From
Analog
Demodulator
150
104
NTSC
CHROMA
DECODER
Y,I,Q
ANALOG
106
DIGITIZER
108
DIGITAL
VIDEO
DECODER
151
From
Digital
Demodulator

FIGURE 1

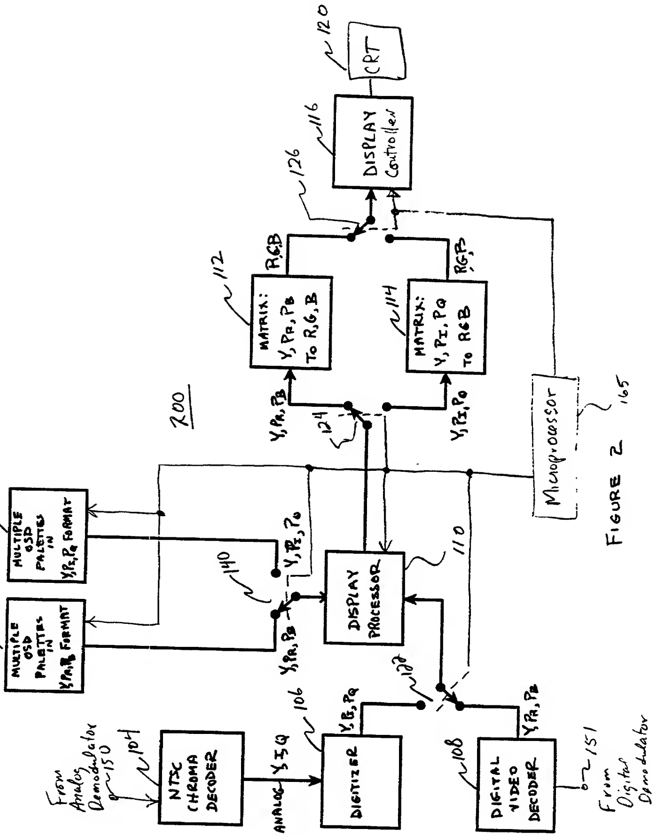
CRT
120
DISPLAY Controller
116
126
R,G,B
RGB
112
MATRIX: Y, PR, PB To R,G,B
114
MATRIX: Y, PI, PQ To RGB
Y, PR, PB
Y, PI, PQ
124
200
Microprocessor
165
105
MULTIPLE OSD PALETTES IN Y,PI,PQ FORMAT
103
MULTIPLE OSD PALETTES IN Y,PR,PB FORMAT
140
DISPLAY PROCESSOR
110
128
From Analog Demodulator
150
104
NTSC CHROMA DECODER
Y I Q
ANALOG
106
DIGITIZER
Y,PI,PQ
108
DIGITAL VIDEO DECODER
151
From Digital Demodulator

FIGURE 2

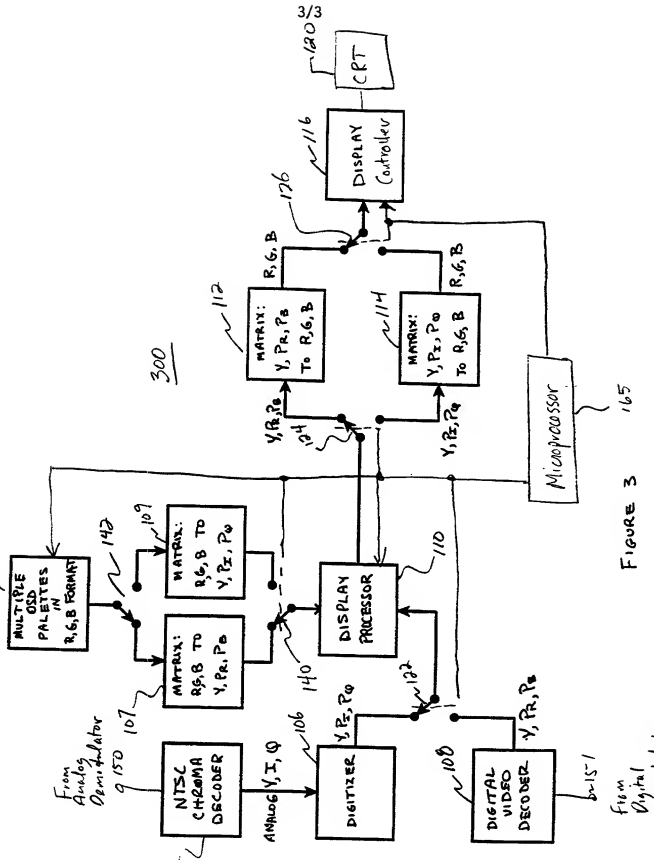
300
CRT
120
DISPLAY Controller
116
MATRIX: Y, PR, PB To R, G, B
112
MATRIX: Y, PR, PB To R, G, B
114
R, G, B
126
Y, PR, PB
124
Y, PR, PB
MICROPROCESSOR
165
MULTIPLE OSD PALETTES IN R, G, B FORMAT
125
142
109
MATRIX: R, G, B TO Y, PR, PB
MATRIX: R, G, B TO Y, PR, PB
107
140
DISPLAY PROCESSOR
110
122
Y, PR, PB
Y, PR, PB
From Analog Demodulator
150
NTSC CHROMA DECODER
104
ANALOG Y, I, Q
106
DIGITIZER
108
DIGITAL VIDEO DECODER
From Digital Demodulator
151

FIGURE 3

EXPRESS EL902321815US

Please type a plus sign (+) inside this box → [+]

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DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

☐ Declaration Submitted With Initial Filing **OR** ☐ Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)

Attorney Docket Number	RCA 89633
First Named Inventor	Charles Bailey Neal
COMPLETE IF KNOWN	
Application Number	/
Filing Date	
Group Art Unit	
Examiner Name	

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

METHOD AND APPARATUS FOR PROVIDING ON-SCREEN DISPLAYS FOR A MULTI-COLORIMETRY RECEIVER

the specification of which *(Title of the Invention)*

☐ is attached hereto

OR

☒ was filed on (MM/DD/YYYY) July 25, 2000 as United States Application Number or PCT International

Application Number PCT/US0017477 and was amended on (MM/DD/YYYY) August 9, 2001 (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT International filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY) Country	Priority Not Claimed	Certified Copy Attached? YES	NO
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto:

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

ApplicationNumber(s)	Filing Date (MM/DD/YYYY)	
US 60/144,151	July 15, 1999	☐ Additional provisional application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

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DECLARATION — Utility or Design Patent Application

Direct all correspondence to: ☐ Customer Number or Bar Code Label [ ] OR ☐ Correspondance address below

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

NAME OF SOLE OR FIRST INVENTOR: ☐ A petition has been filed for this unsigned inventor

Given Name	Family Name or Surname
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Inventor's Signature	Date
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NAME OF SECOND INVENTOR: ☐ A petition has been filed for this unsigned inventor

Given Name	Family Name or Surname

Inventor's Signature		Date

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Mailing Address

Mailing Address

City	State	ZIP	Country

☐ Additional Inventors are being named on the ____ supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.